NATIONAL WEATHER SERVICE - MEDFORD, OREGON

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The Crater Chronicle

The Surprise Killer of the Oregon Coastline

Brian Nieuwenhuis, *Meteorologist*

All too often, we hear stories about "Sneaker Waves" that surged up the beach without warning. Waves that swept beachgoers off their feet and into deeper water, or trapped people under heavy logs that seemed stable just seconds before. A sneaker wave event near Coos Bay, luckily in which no one was injured, was recorded on video back in January of 2016, and is visible online (starting around 30 seconds into the video). Sadly, events like this one result in injuries and deaths every year. But what exactly are sneaker waves, and can we do anything to predict them?

Image retrieved from Greater Farallones National Marine Sanctuary

Simply put, sneaker waves are unexpected large waves that run much further up the beach than other waves, creating a strong surge of water than can completely cover an entire beach of previously dry sand, right up to the dunes or rocks. A person observing the waves for a long period of time might not ever see waves of this size, leading them to a false sense of security. The unsuspecting beachgoer may then go out to walk the beach, look at tide pools, attempt to walk around rocks, or simply just enjoy the beach when they are surprised by a large wave that can sweep them into deep cold water, throw them into rocks, or even put them in danger of being injured by large logs that are floated by the sudden surge of water. Anyone enjoying a day at the beach along the California, Oregon, and Washington coasts should always be aware of the threat of these waves, and keep an eye on the sea at all times. Sometimes, just a few seconds warning is all it takes to avoid a tragedy. Sneaker waves often pose the most danger on calm, clear weather days. This is because beachgoers are lured into a false sense of security with the calm weather and don't realize that danger from the sea can occur at any time, regardless of weather conditions. *cont. on next pg.*

Have a question you'd like to see answered in the next edition? Send it our way! The next issue will be published in March 2017 for the Spring edition.

Submit a Question for the Next Issue of the Crater Chronicle's "Ask A Meteorologist" Column!

E-mail: Ryan.Sandler@noaa.gov

INSIDE THIS ISSUE

Scientifically, these waves are not well understood. Informal studies conducted along the shoreline of the Pacific Northwest have produced some possible conditions that favor the development of these waves, but no conclusive results have ever been found. Unfortunately, this means that no reliable warning criteria have ever been developed. To this end, the NWS office in Medford, in conjunction with offices in Portland, OR, and Eureka, CA, are working with researchers at Oregon State University to better understand this phenomenon. The research will hopefully reveal enough information about sneaker waves to allow us to better predict them, and effectively warn the public when such an event is likely to occur. Until then, remember the risks that waves can present, and never turn your back to the ocean.

Image taken by Mary Zuschlag at Shore Acres State Park in Coos Bay, OR

Fire: The Dangers Left Behind

Spencer Higginson, *Service Hydrologist*

2017 was a big year for fires in the west. In the area covered by the Medford National Weather Service Office, (SW Oregon and Siskiyou and Modoc Counties in California) there were dozens of fires which burned well over 300,000 acres. Luckily, the fire season in our area has come to an end, unlike southern California. Once the fires were contained and extinguished, home and land owners who were spared, collectively breathed a sigh of relief now that the danger has passed. Or has it?

After a fire burns through an area, the area is changed and a burn scar is left behind. The changes come in many forms. In some areas a fire may burn through very quickly, consuming the smallest fuels, like grass and twigs, leaving minimal damage behind. In other areas the fire may burn very hot for an extended period, consuming almost everything in its path. Here the burn scar is dramatic and can even resemble an eerie, moonscape-like scene. These various burn characteristics will determine the level of danger that remains after the flames are out.

The threats in a burn scar vary from life-threatening (increased flood potential to landslides to hazardous trees (weakened trees likely to fall) and nuisance (spread of weeds, loss of fence line, etc.). So, how can you determine the risk that remains?

If you live near a burn scar, take note of your surroundings. Is there a significant loss of vegetation? The greater the loss of vegetation, the greater the amount of runoff in a rainstorm. This increased runoff could be minimal or it could cause flash flooding, posing a serious risk to life and property. Do you live below or on the side or top of a hill? When rain falls on a hill slope that has burned, the slope becomes more susceptible to landslides. If the burn is minimal, the threat is minimal. If the slope is severely burned, the risk of a landslide is significantly higher. Are there trees that burned on your property? These hazardous trees can come down during a storm, on a breezy day, or even on a calm day. Always watch for trees that have been weakened by fire. Some trees may have already fallen but are hung up by other trees and are ready to come down at any time. These hazard trees must be removed or the area needs to be avoided.

How can you prepare? Make a plan based on what threats you face in the post-fire environment. Have emergency supplies on hand and even be prepared to evacuate on a moments notice. Stay tuned to weather forecasts as the weather plays a major role in triggering many of the post-fire dangers. You can even reach out to your local government officials to get answers to questions about the dangers you face. Until vegetation recovers enough to capture rainfall and re-stabilize the soil, the risk remains. Stay vigilant and stay safe!

All About Air Stagnation

Ryan Sandler, *Warning Coordination Meteorologist*

When a strong and persistent high-pressure system (Fig. 1) is over the region during the summer it usually results in a heat wave and possibly record heat. This occurred in early August 2017 when the temperature peaked at 112 deg. at the Medford Airport.

Strong and persistent high-pressure is responsible for both heat waves in the summer and air stagnation, and possibly pollution, in the winter. They don't seem related so how can this occur? High-pressure aloft is associated with warm air, meaning that the air at 5,000, 10,000, and 20,000 feet above the ground is warmer than normal. In the summer, the sun is high in the sky and the days are long so there is much more solar energy available to heat the ground and mix the warm air aloft to the ground allowing additional warming as this air sinks and warms through compression (i.e. the increased weight of the atmosphere pushing down at lower elevations). This mixing is sufficient in the summer for afternoon breezes to develop. On August 2, 2017, the Medford Airport wind averaged close to 10 mph in the late afternoon and early evening.

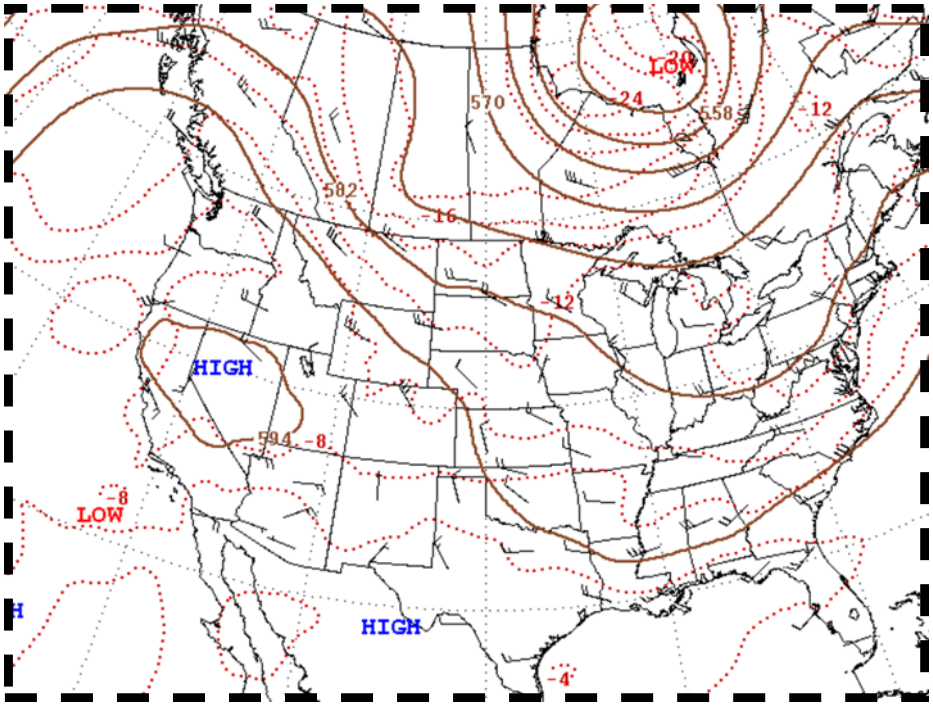


Fig. 1 August 2, 2017: Strong high-pressure aloft with a high temperature of 112 degrees at Medford.

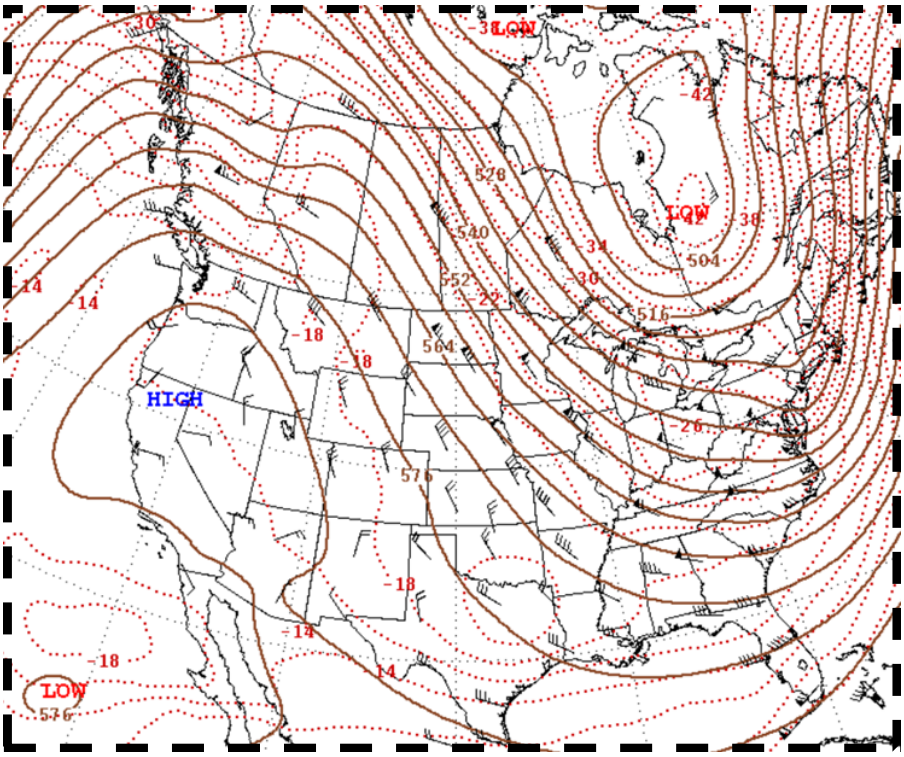


Fig. 2 December 10, 2017: strong high-pressure aloft with a high temperature of 48 degrees at Medford

Similar high-pressure conditions (Fig. 2) in the winter create very different impacts on the ground. The unusually warm air above means the mountains will typically see warmer than normal conditions. Sexton Summit in Josephine County is a good mountain example located at 3,832 feet above sea level. On Dec. 10, 2017, the high at Sexton Summit was 55 deg. and the low 45 deg. which was 13 degrees ***above*** normal. On this same day, the Medford Airport located at 1,300 feet above sea level had a high of 48 deg. and a low of 22 deg. which was nearly 5 degrees ***below*** normal. Why the difference?

The difference has to do with the seasons. In winter, the sun is low in the sky and the days are short so there is much less solar energy compared to the summer. In winter, low clouds and fog often develop in the low-lying valleys because the dense colder air sinks and settles. The weak winter sun is unable to mix the air so the warmer air stays above and is separated from the colder air below. On December 10, 2017, the Medford Airport wind averaged just 1 mph in the late afternoon.

Without proper mixing (ventilation) the

particulates from wood stoves, open burning, vehicles and industry accumulate in the air near the ground. You can see the difference if you go into the hills surrounding the valley. The sky will be a deeper blue above the pollution in the hills while a hazy blue sky will be seen in the valley, assuming there are not low clouds and fog (Fig. 3). This haziness is the result of particulates building up in the atmosphere. If enough of these particulates accumulate then the air quality could deteriorate into the "Unhealthy" category. The winter air quality has improved over the past few decades due to cleaner vehicles and industry as well as restrictions to outdoor burning during stagnant weather patterns. The National Weather Service issues Air Stagnation Advisories in Oregon for these long duration high-pressure weather patterns in late fall and winter. If the air quality is forecast to become close to "Unhealthy" then the Oregon Department of Environmental Quality will issue an Air Quality Advisory.

Fig. 3 December 12th at 830 am. Freezing fog at 21 degrees near the Medford Airport with an Air Stagnation Advisory continuing over the area.

Know Where to Find Road Conditions when Snow Impacts Roads

Misty Firmin, *Meteorologist*

When snow is occurring or has just ended, we receive A LOT of calls at the office from people asking what the road conditions are like. As much as we would like to be able to tell callers about road conditions, we simply can not. This is because we are meteorologists; we forecast the weather. If we were to give road conditions, that would be the equivalent of calling the Department of Transportation for a weather forecast. We can give you a forecast for an ideal window when snow will be less likely to impact travel, but we simply can not judge what ideal road conditions are. What may seem like ok or ideal road conditions for one of us in the office, may be considered highly treacherous for the caller. Aside from that, we will just simply look at area webcams for an idea on what road conditions are, which are the same sources available to the public. So when we receive a call inquiring about road conditions, we refer the callers to either tripcheck.com or 511 if they are looking for Oregon road conditions. If they are looking for California road conditions, we refer them to the Caltrans website, dot.ca.gov.

For a weather forecast:

www.weather.gov/mfr

541-773-1067 , we're here 24/7/365

For Oregon Road Conditions:

www.tripcheck.com

Call: 511 (while in OR)

For California Road Conditions:

www.dot.ca.gov/

Call: 511 (while in CA) or 1-800-427-ROAD (7623)

Q. What's the weather going to be like on my road trip?

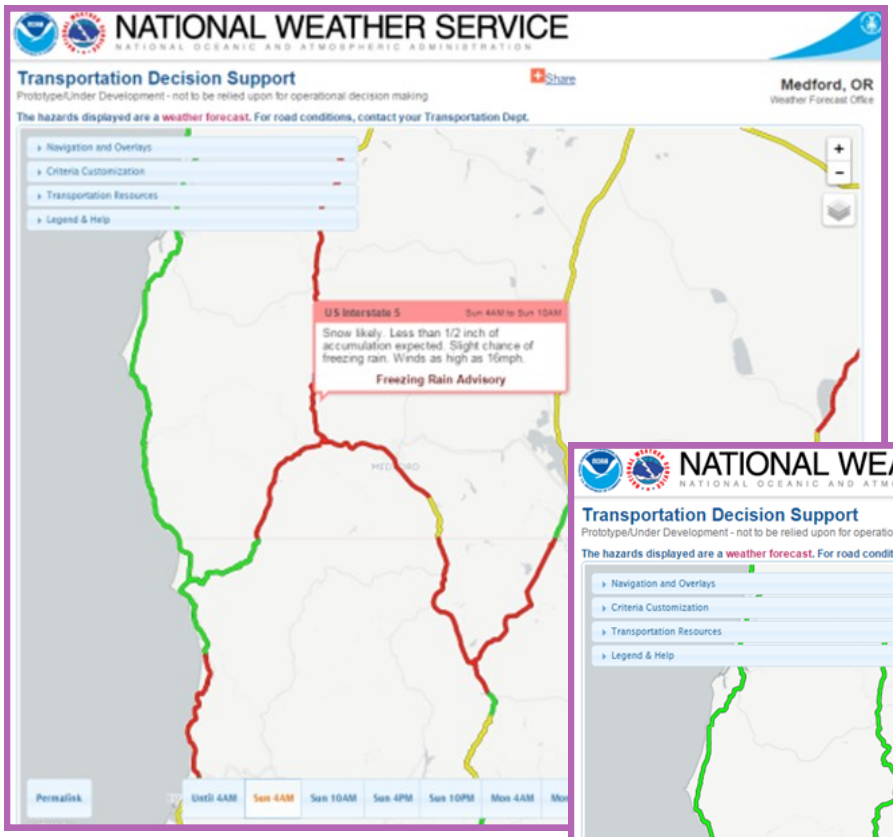
A. Check out the "Transportation Decision Support" product!

Shad Keene, *General Forecaster*

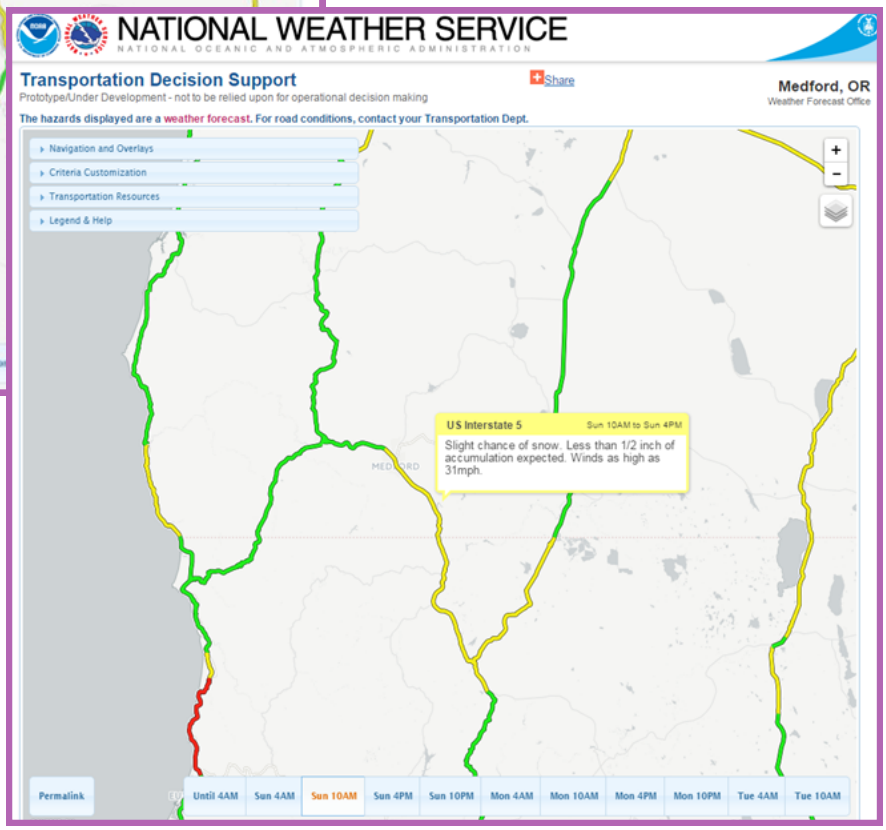
I can't tell you how many times weather forecasts have factored into my road trips, whether it's driving across the country from one job to another, traveling hundreds of miles to see family over Thanksgiving, or driving to the mountains for a day of snowshoeing. If you're like me, weather forecasts are critical components of travel plans.

There are hundreds of weather products out there that provide weather information that can be used in route planning, but if you want a quick, intuitive, and straightforward way to make a "go/no go" decision, the National Weather Service has developed a webpage to meet your needs. The Transportation Decision Support webpage provides you with clear "windows" of favorable weather for traveling, and can also highlight dangerous periods of weather along roadways.

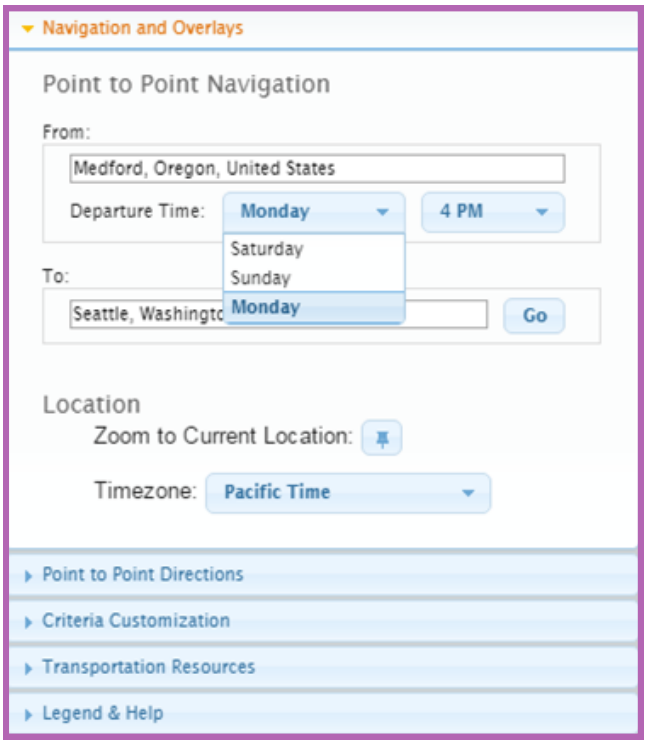
This travel page can be accessed from the left hand menu found on the weather.gov/medford webpage under "Forecasts" and then clicking on "Travel". The web address is: http://www.wrh.noaa.gov/wrh/travel/?wfo=mfr. There are many options to explore on this page, but I'll only discuss two of them here. To highlight these, I'll use a previous situation in which a wintry mix of precipitation was forecast west of the Cascades.

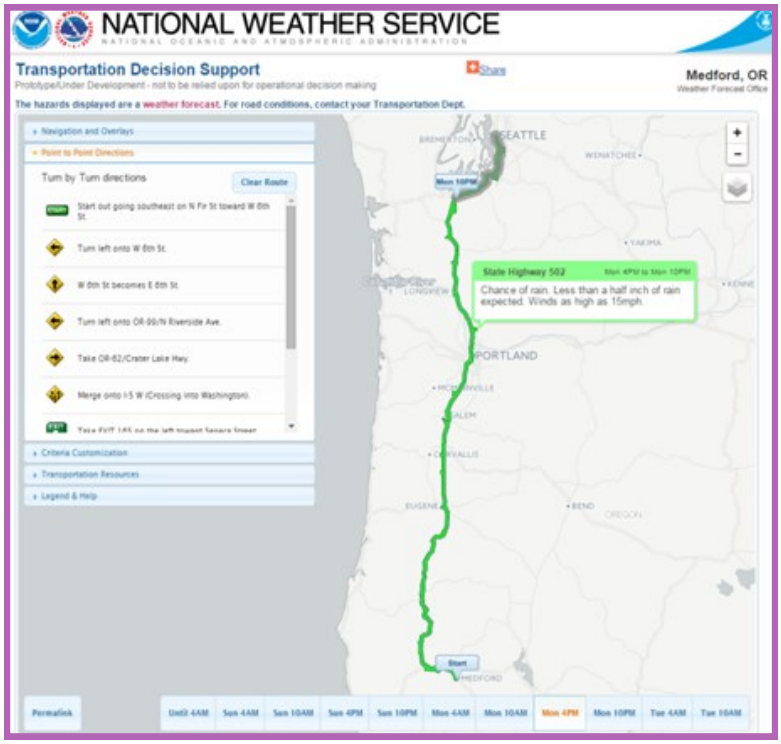


First, a map with interstates and major highways is displayed, color-coded according to how favorable or unfavorable the weather is for driving. The criteria used for this color-coding is found on the top left pull-down menu titled "Criteria Customization". If you look to the bottom of the page you'll see time buttons. I've chosen Sunday at 6am, and as you can see, many routes are colored red. If you click on a segment of roadway, the weather expected along that road is shown in a pop-up window. For Sunday at 6am, traveling along most of Interstate 5 from Ashland to Grants Pass and points north could be hazardous, and this is because of the Freezing Rain Advisory that had been issued. If you are flexible in your travel times, you could check later times to see if the colors turn to yellow or green and then investigate the weather by clicking on the road segments. For instance, just 4 hours later, at 10am, the colors have changed from red to green and yellow because the Freezing Rain Advisory has ended, and there is just a slight chance of snow with some gusty winds near Ashland, which the yellow popup box displays if you click on that segment of Interstate 5. *cont. on next pg.*



The other feature I wanted to highlight is the route forecast. Just navigate to the top left menu and click on "Naviation and Overlays". Type in your starting and ending location, the time you plan on traveling, and then choose "Go". You'll be greeted with a route that's color-coded according to the weather expected along the way.





So, please give this product a try and relay any feedback you have to w-pih.webmaster@noaa.gov. You can also try the mobile-friendly version for your smartphone, found at http://www.wrh.noaa.gov/wrh/travel/mobile/, but this version should automatically be displayed if you enter the webpage on your mobile device. Lastly, don't forget to visit our partner agency websites, Caltrans and ODOT, for current road conditions. If you must travel in wintry conditions, check out the graphic below for tips and helpful websites to be prepared!

Progress Continues on Advanced Geostationary Satellite Upgrade

Mike Stavish, *Science Operations Officer*

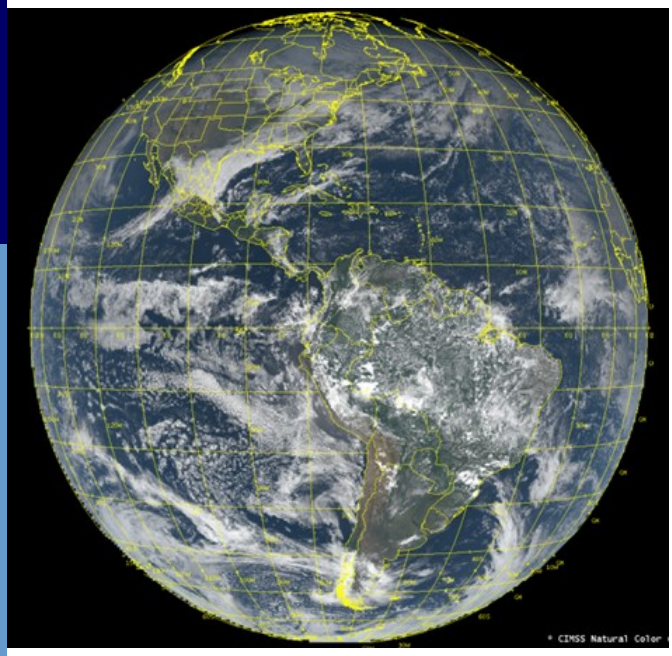
The new U.S. Geostationary satellite series consists of 4 high-tech satellites eventually being named GOES 16, 17, 18, and 19. There are 4 because two serve as spares while two are considered the operational GOES East and GOES West satellites.

GOES-16 is now in place officially as the "GOES East" satellite near 75 degrees west longitude and is providing the entire contiguous U.S with a variety of advanced imagery assisting forecaster in serving the critical NWS mission.

The future GOES-17 satellite to be placed in orbit at 135 degrees west longitude is currently known as *GOES-S*. It is preparing for a March 1st, 2018 launch aboard an Atlas V 541 rocket from Cape Canaveral Air Force Station in Florida.

Future GOES-17 arriving at Kennedy Space Center in Florida aboard a U.S. Air Force C-5M. Credit: https://www.goes-r.gov

The new satellites vastly improve space-observing capabilities, with the greatest improvement being increased resolution both in time and in space – pictures are clearer and come in more often than they used to. In addition, advanced new scanning strategies allow forecasters to request higher-resolution zoomed in areas, known as "mesoscale domains", to aid in severe weather situations.



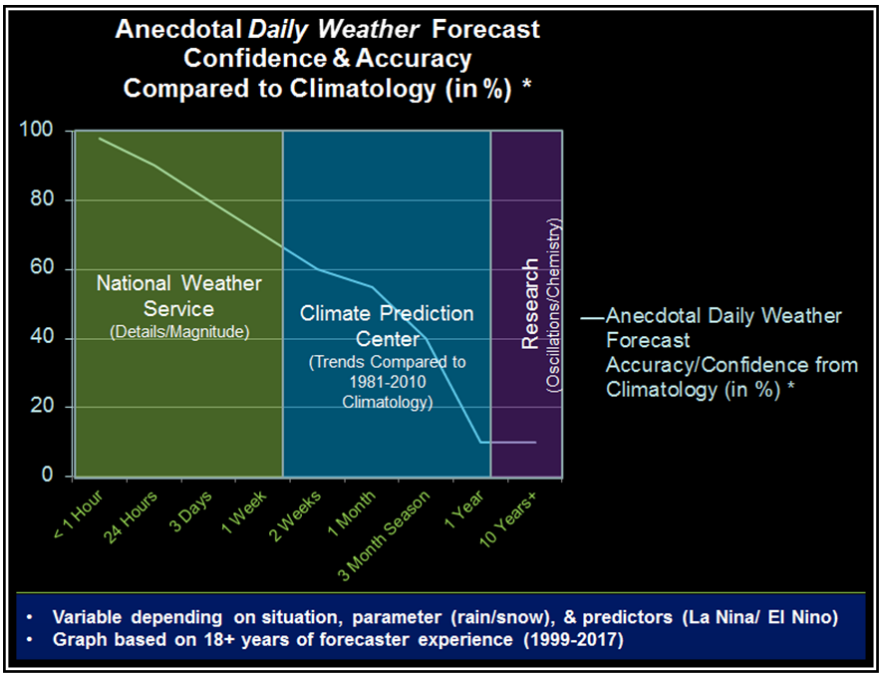
GOES-16 Full Disc "Natural Color" RGB Image

With 16 channels to observe, many new products are created with the imagery, one of which is "RGB" imagery. These images are created by applying a hue of red, green, or blue to 3 separate channels of the imagery and combining them to form a composite that can reveal multiple characteristics in a single image. Three areas where western region forecasters will benefit from these increased new capabilities are fog forecasting, wildfire and smoke monitoring and severe thunderstorm warnings.

Short Range vs. Long Range Weather Forecasts:

Brett Lutz, *Meteorologist*

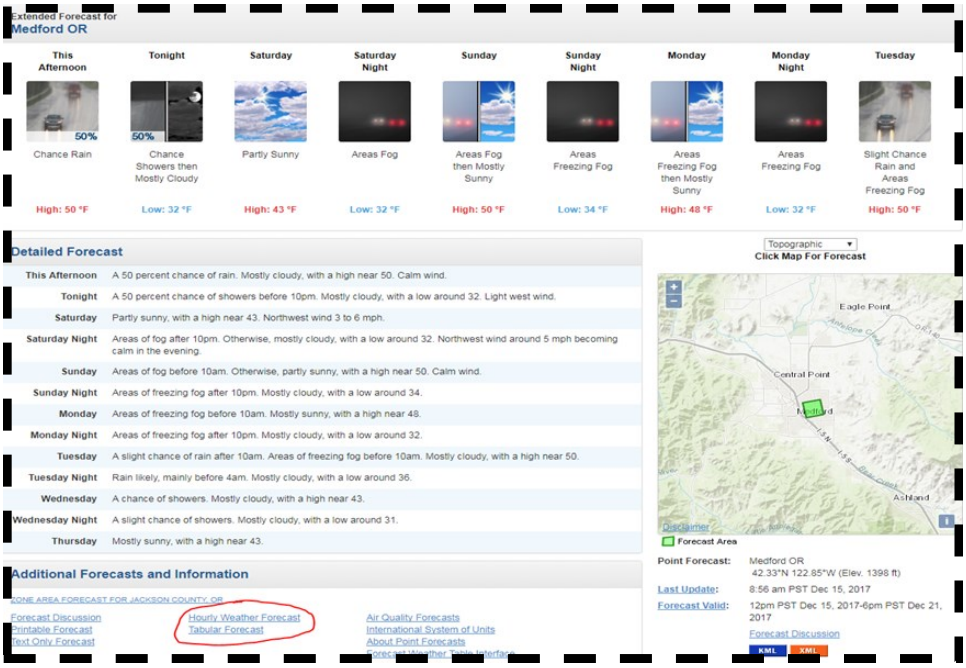
Those of you who have been utilizing National Weather Service weather forecasts have likely noticed that forecast accuracy has generally increased over the years, especially as compared to 20-30+ years ago. General forecast reliability has improved, and forecasts are usually quite accurate in terms of details for the next day. Forecasts also tend to be useful for planning purposes most of the time 3-5 days out. Beyond that 3-5 day time frame, forecast accuracy generally declines with time, though we and our partners at the Climate Prediction Center can often forecast general trends compared to climatology correctly out to 7 to 14 days most of the time- and sometimes longer. This article discusses forecast confidence, accuracy, and reliability at different time scales in hopes that it will help you with planning, and to avoid possible frustrations when forecast confidence is overstated.



Let's begin with a graphic (pictured right) that is a forecaster's anecdotal assessment of daily weather forecast confidence and accuracy as compared to climatology (Y-axis in %) at different time scales (X-axis). This graphic is based on over 18 years of my experience as a forecaster in both the US Air Force as a Weather Officer and forecaster, and my forecast experience in the National Weather Service. The graphic also indicates the agency/entities that have primary responsibility and expertise in making such forecasts.

1-3 Day Forecasts:

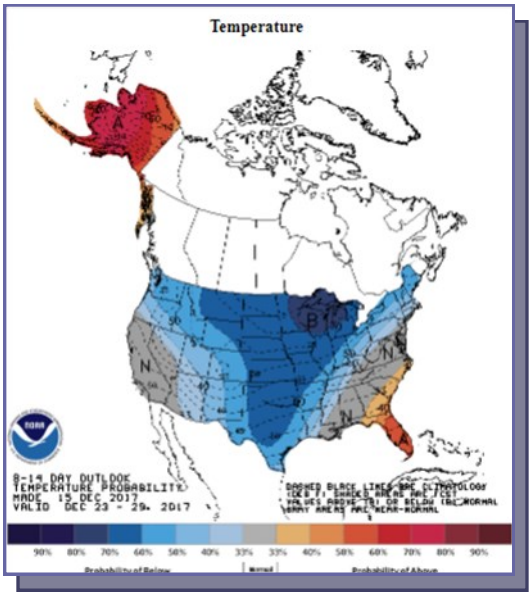
This is the time period during which weather forecasts tend to be most accurate because we have the most observational data to base our forecasts on. This is often our primary time frame of focus for forecast updates here at the NWS Medford Office. The numerical models that we use make assumptions about the current state of the atmosphere where we don't have observations by using data from where we do have observations. These observations come from human observers (including Spotters), automated weather observations, satellites, radar, weather balloons, and aircraft, among other sources. As these models go out in time, the errors from these assumptions amplify, so the errors are at a minimum at the shortest time scales. We also have finer scale model guidance and more models to work with in the short term, which generally increases forecaster confidence in a particular solution. All that said, clearly short term models still have their flaws, as do the forecasts we make using them. For instance, while we can be confident that it will be rain at a given location on day 1, and we are pretty sure the rain will occur in the morning and not the afternoon, it still can be difficult on the day of the rainfall event to pin down the exact minute or hour that rain will begin and exactly how much will fall down to the nearest hundredth of an inch. Similarly, while we usually know when thunderstorms will be possible 1-3 days out, model guidance has difficultly pinning down the location, timing, and magnitude of these thunderstorms, and especially how much precipitation and lightning they will produce. Experienced forecasters often rely on their past experiences and related rules of thumb to determine the threat and location of thunderstorms on a given day. Other short term inaccuracies also tend to occur related to low elevation snowfall, particularly in and near the Illinois Valley, and temperatures at a given location during strong inversion situations. *cont. on next pg.*



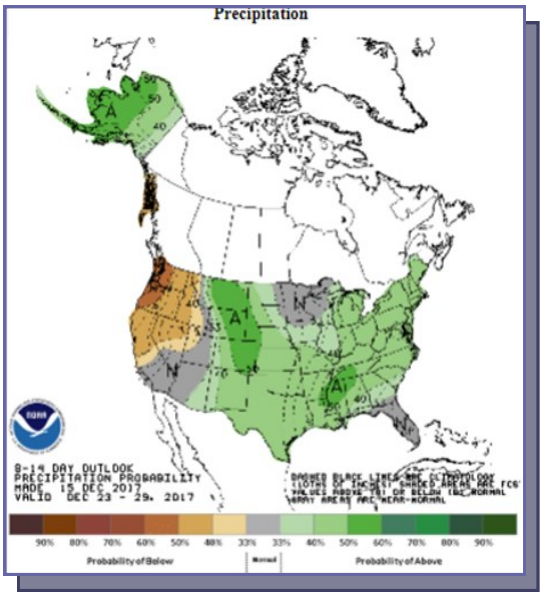
3-5 Day Forecasts:

3-5 day forecasts are similar to 1-3 day forecasts in terms of accuracy and source, but timing and magnitude tend to be less acurate. Thus, a frontal system that is expected to bring rainfall on day 5 could speed up, resulting in rain on day 4 instead, or slow down resulting in rain on day 6 instead. Other challenges in the short term usually are related to when a frontal system strengthens, weakens, or changes its track, as this can greatly affect sensible weather. For instance, if snow is in the forecast for valley areas where it rarely occurs, an increase in strength of a storm could cause the wind to be strong enough to mix out or even warm the cold air required for low elevation snowfall. Wind trajectory can make a huge difference in sensible weather since much of our weather is affected by the mountains and valleys. If the wind shifts such that it blows through a valley, winds will be stronger. If winds are such that they force air to rise as it impinges on a mountain, then that mountain will experience enhanced precipitation.

6-14 day Forecasts:



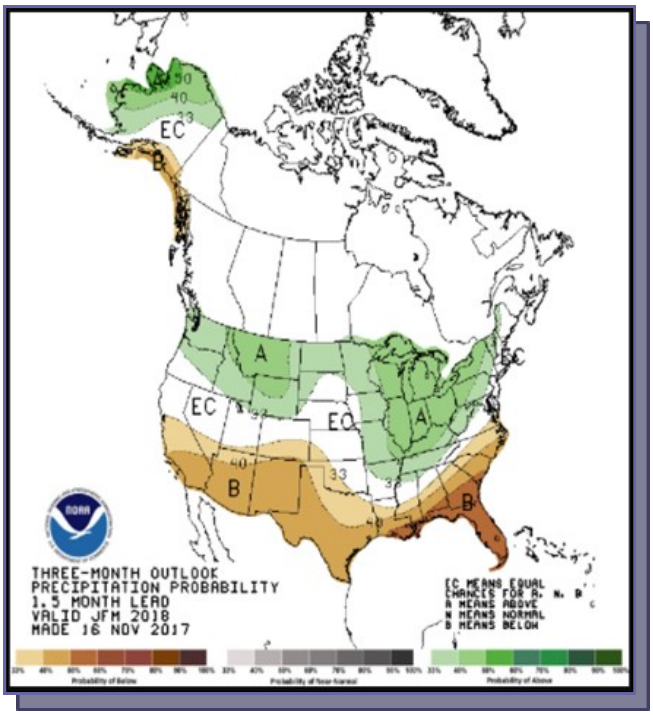
National Weather Service weather forecasts go out 8 days. The Climate Prediction Center issues both a 6-10 day and 8-14 day probability forecast product on a daily basis indicating how conditions are expected to differ from climatic normals. All of these forecasts made by CPC are based on the average conditions observed from the 1981-2010 climatic period. Thus, there's overlap in the 6-8 day window and, naturally, both of these offices are part of the National Weather Service. Forecasts at this time window tend to fluctuate more in terms of timing and magnitude than shorter term forecasts so much so that one numerical model can be showing sunny high pressure at the same time that another is indicating rainy low pressure for a given location at a given time. Thus, forecasts at this time frame often rely on collections of models called ensembles. Ensembles are essentially different renditions of the same numerical model run on small differences in initial conditions or different physics schemes as an attempt to wash out small scale differences that develop in them due to their individual assumptions. Ultimately, one model can be run 20+ different ways. Thus, forecasts in this time frame tend to focus more on how the forecast for that time period will differ from climatology with idea that we have accuracy in forecasting the overall trend in this time period, but much less skill at this time scale in forecasting details. When the individual ensemble model members are in good agreement, our confidence in the long term tends to be higher than when they are indicating highly disparaging forecasts.



1 Month Forecasts:

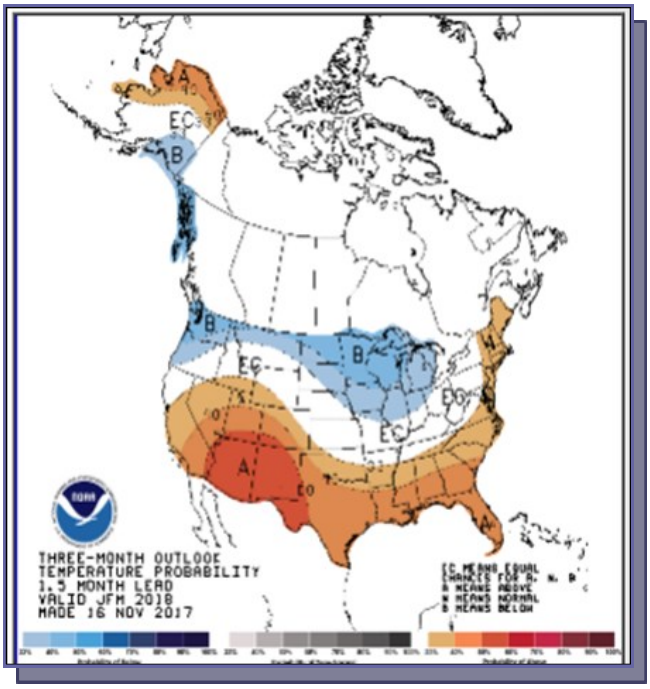
1 Month forecasts issued by the Climate Prediction Center are heavily weighted by the forecast for the early part of the upcoming month- usually the first 2 weeks of the month- where confidence tends to be highest. One month forecasts are issued by CPC on the 3rd Thursday of every month for the next month, and then are updated on the last day of the month. These forecasts, like the 6-10 and 8-14 day products issued by CPC, are presented as probabilities of average temperature and precipitation at those time periods being near, above, or below climatology. Just like the 6-10 day and 8-14 day products from CPC, all of these forecasts are based on the average conditions observed from the 1981-2010 climatic period. Thus, these forecasts are essentially confidence level forecasts for average temperature and average precipitation for that time period being near, above, or below climatology. While magnitude of the anticipated anomaly/difference from climatology can often be implied based on the probability forecast given, the forecast is verified based on simply whether or not observations for that period were near, above, or below normal- not the magnitude.

In an effort to bridge the gap between weather and climate forecasts and to provide more useful information to decision makers, our Weather Forecast Office here in Medford has been issuing an experimental one month outlook along with its Monthly Climate Summary each month. This is usually issued in the first week of each month. In that outlook we talk about forecast confidence in predicted anomalies by CPC, location and potential magnitude of those anomalies, and potential impacts from the expected conditions. Please see the article on the Monthly Climate Summaries and One Month Outlooks in this edition of the Crater Chronicle for further information on this.



3-9 Month Forecasts:

Fire agencies, water managers, farmers, recreationalists, and the general public often ask us what the forecast will be for an upcoming season, as having such information can help with staffing and decision making- provided it is somewhat accurate. Like the last two forecast periods discussed above, forecasts at this range are issued by CPC and are given as compared to the 1981-2010 temperature and precipitation climatology. When El Nino or La Nina is expected or present, especially a strong one, CPC will often base its winter forecast on the differences expected under each of these different patterns based on past similar events. While long range models across the world are used in making these forecasts, they tend to have low skill as compared to climatology when an El Nino or La Nina are not present- and, sometimes, even when one is. A quick look at individual La Nina events will show that each La Nina is a bit different and some actually show a pattern opposite from what the mean of them indicate. Thus, CPC is effectively playing the odds by using what has happened in the past to forecast what will happen in the future. While this usually adds skill over average climatology, sometimes the forecast for a given location is opposite of what occurs.



Another predictor that CPC uses in long term forecasts is current climate trends, particularly those observed in the last 10 years. Therefore, since global warming has been generally and steadily occurring, most long range forecasts are skewed toward a warmer forecast. In areas where the global warming signal is stronger in a certain season, CPC is more likely to show increased probabilities of warmer temperatures than normal in that season. Remember that climate is what you expect and weather is what you get, so there's good reason for CPC to use the methods indicated above to produce probability forecasts. Just be sure to use them with caution.

Forecasts Beyond 9 Months – 100 Years from Now:

Skill is very low to none for daily weather forecasts beyond 9 months out, and this time frame certainly is a topic of ongoing research to try to increase skill. There are certainly some oceanic oscillations such as the Pacific Decadal Oscillations that fluctuate on intervals of 10 years and beyond, but predictability of changes in sign of such oscillations is low, especially at short time scales. Thus, changes in atmospheric chemistry and the Earth's radiation budget are the primary means of prediction at these longer time scales. Similar to how ensemble model wash out differences among various individual model runs, climate models wash out the daily weather and, instead, attempt to predict long term generalities. Lag time effects on the Earth's radiation budget and other greenhouse gases on the general state of the climate are the primary predictors at this time scale.

Conclusion:

It is our hope at the NWS that the above information will help you to better find and interpret weather and climate forecast information. Clearly, there is a big difference in a daily weather forecast for tomorrow versus one for 100 years from now. While this difference is often not well expressed in the media for purposes of brevity, it is very important to understanding how much faith one should have in any given forecast. Certainly give us a call if you have any further questions on this topic, as we'd be happy to answer them. Thanks for reading!

Monthly Climate Summaries & Next Month's Outlook

Misty Firmin, *Meteorologist*

August 2017 Weather Review

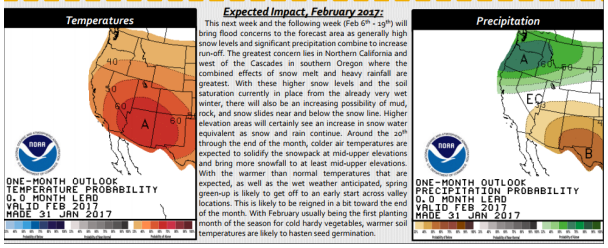
Hot and smoky is how August 2017 will be remembered. During the first week of August, dangerously hot temperatures occurred across the forecast area, where record all-time high temperatures were challenged. Many of the climate sites reached values that were only a few degrees shy of the all time warmest temperature for that location. To go along with this, overnight temperatures were also very warm and provided little, if any, relief from the hot daytime temperatures. Another unusual aspect of this heat was the duration of the very hot temperatures. Some locations set records for the number of consecutive days at or above 100 degrees.

This stretch of heat broke thanks to cloud cover and unfortunately with this cloud cover came thunderstorms that put out over 3,000 strikes over the course of the following week. These lightning strikes were responsible for starting numerous fires across the area. High pressure dominated the weather for the majority of the remainder of the month. This led to hot and dry conditions over the forecast area, which was very conducive to fire growth. The fires ignited from the lightning outbreak quickly grew in acreage and produced a lot of smoke. Southerly winds carried the smoke north, creating very smoky conditions with poor air quality and low visibilities for the majority of the area west of the Cascades. These smoky conditions continued for the last half of August with only a day or two of relief as a weak trough passed through the area around the 24th.

One benefit from the smoke was that high temperatures during the end of the month were moderated. Another round of very hot temperatures was expected during the last week, but the thick smoke kept temperatures around 5 -10 degrees below what was expected. To grasp how much the smoke tempered high temperatures, record setting high temperatures occurred for most locations outside of smoked-in locations. Regardless of the smoke helping to temper high temperatures, August 2017 still ended up the warmest August on record for many climate sites in the forecast area.

February 2017 Outlook

The official CPC forecast calls for increased chances of above average temperatures (34-45%) and increased chances of above average precipitation (50-70%) for the entire forecast area. As of Feb 6th, model data still strongly supports this CPC forecast. More specifically, the wettest conditions across the area are expected to be in the next week, Feb 6th-12th, with above average weekly precipitation decreasing as compared to normal each week through the end of the month. It should be noted that models are trending to near normal precipitation values for the last week of the month, but confidence is low for precipitation in that last week due to typically marginal model performance at that time range. Current indications are that the weekly temperatures are likely to be above normal until about the 20th, and then are expected to be near to below normal. Here at NWS Medford we believe that the month is likely to be warmer and wetter than normal across the forecast area. Confidence is highest in precipitation being well above average in our northern California areas due to a persistent and directionally favorable storm track. Confidence is highest in temperatures being above normal in the Interior Valleys west of the Cascades due to downslope winds from this storm track.

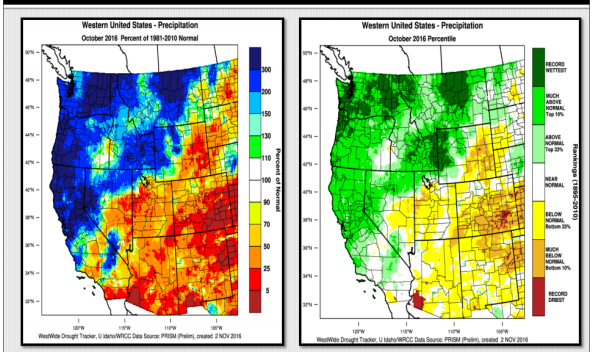


Do you like climate data? Ever wondered how the previous month shaped up in terms of average temperatures or precipitation? Wondering just how much rain fell in October 2016, one of the wettest Octobers on record? We have a Monthly Climate Summary that can answer these questions for you! At the Weather Service Office in Medford, we have been producing monthly climate summaries since April of 2016, in which we summarize the details of the overall weather that occurred during the previous month and provide a next month's outlook. The next month's outlook is typically broad in nature, explaining what to expect in terms of above, below, or normal precipitation and temperatures. All released editions can be found on our website @ www.wrh.noaa.gov/mfr/fcst/index.php.

Topics include:

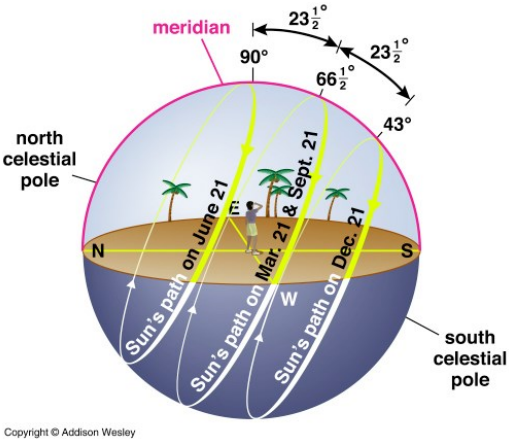
* Previous Month's Weather Summary
* Next Month's Weather Outlook
* Average Temps
* Average Max/Min Temps
* Total Precipitation
* Crater Lake temps, precipitation, snowfall, & snow depth
* Monthly Drought Outlook, issued by the Climate Prediction Center
* Summary of significant weather events
* New temperature & precipitation records set during the month
* Snowpack status (during winter season)
* Fuels status (during fire season)

October 2016 Observed Precipitation



Astronomy Happenings

Misty Firmin, *Meteorologist*



Winter Solstice: December 21st, 8:28 am PST

The astronomical start of winter falls on Wednesday December 21st at 8:28 am PST. The winter solstice marks the time when the Northern Hemisphere completely tilts away from the sun. The sun's rays are at it's least intensity in the Northern Hemisphere because the position of the sun is at its farthest point south of the equator; directly over the Tropic of Capricorn in the Southern Hemisphere. After the winter solstice, the Northern Hemisphere will begin tilting toward the sun until it reaches the summer solstice; marking the astronomical start of summer. The winter solstice also marks the shortest day of the year. On this day, there are only 9 hours of daylight in southwest Oregon! Compare this to the summer solstice on June 20th when there are 15 hours of daylight!

National Weather Service - Medford, Oregon

National Weather Service
Medford Weather Forecast Office
4003 Cirrus Drive
Medford, OR 97504-4198

Phone: (541) 773-1067 Fax: (541) 776-4344
Email: ryan.sandler@noaa.gov

Newsletter Editor:
Misty Duncan, Meteorologist Intern
Email: misty.duncan@noaa.gov

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Our Vision

Professionals focusing on science, teamwork, and customer service to design and deliver the best decision-support information to our community.

Our Mission

Our team at the National Weather Service Office in Medford strives to deliver the best observational, forecast, and warning information through exceptional customer service, extensive training and education, maintaining quality electronic systems, and relying upon an outstanding team of weather spotters and cooperative observers. We do this within the overall mission of the NWS to build a Weather-Ready Nation:

To provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

Our Values

Trust, Integrity, Professionalism, Service, Teamwork, Ingenuity, Expertise, and Enthusiasm.

About Us

The Weather Forecast Office in Medford, Oregon, is one of more than 120 field offices of the National Weather Service, an agency under the National Oceanic and Atmospheric Administration and the United States Department of Commerce. The Weather Forecast Office in Medford serves 7 counties in southwestern Oregon and 2 counties in northern California, providing weather and water information to more than a half-million citizens. We are also responsible for the coastal waters of the Pacific Ocean from Florence, Oregon, to Point St. George, California, extending 60 miles offshore. The office is staffed 24 hours a day, 7 days a week, and 365 days a year by a team of 26 meteorologists, hydrologists, electronic technicians, hydrometeorological technicians, and administrative assistants, under the direction of Meteorologist-In-Charge John Lovegrove.